

**REMARKS**

This is in full and timely response to the Final Office Action dated February 8, 2006.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendment: (a) places the application in condition for allowance (for the reasons discussed herein); (b) does not raise any new issues requiring further search and/or consideration; (c) satisfies a requirement of form asserted in the previous Office Action; and (d) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of this amendment is respectfully requested. Reexamination and reconsideration in light of the above amendments and the following remarks are respectfully requested.

**Information Disclosure Statement**

An Information Disclosure Statement is submitted concurrently with this response. The IDS cites materials referenced below in support of the Applicant's arguments.

**Claim Rejections – 35 U.S.C. § 102**

In the Action, claims 6, 8-10, and 12 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Takayama '549 et al. (US Patent No. 5,948,549). This rejection is respectfully traversed.

Independent claim 6 of the present application recites a copper based sintered contact material, wherein, *inter alia*, the total amount of intermetallic compounds is 0.1 to 10% by volume.

In contrast, Takayama '549 fails to disclose, teach or even suggest the total amount of intermetallics compounds being equal to 0.1 to 10% by volume, as is recited in claim 7 of the present application. In fact, the Action has conceded that "Takayama '549 is silent as to the volume % of intermetallics in the contact", thereby rendering the § 102 rejection of claim 7 ineffective.

The Office Actions suggests that intermetallic compounds are likely present in Takayama '549 due to the presence in the starting mixture of individual elements capable of forming intermetallics. However, as shown by the references cited below, it would be highly

---

unlikely or even impossible for the elements cited in the previous Office Actions lead to the development and dispersion of intermetallics in the copper based sintered contact material.

*Evidence teaches against formation of a Tungsten – Tin intermetallic*

According to *Hansen's Constitution of Binary Alloys*, WSn is not an intermetallic which was formed when attempts were made to alloy W and Sn (*see Hansen's at page 1217*). Test results demonstrate that W wire is not dissolved in molten Sn heated to 1680°C. Therefore, Takayama '549 does not teach or suggest the formation or dispersion of an intermetallic compound from W and Sn.

*Evidence teaches against formation of a Molybdenum – Tin intermetallic*

According to *Hansen's Constitution of Binary Alloys*, MoSn is not an intermetallic which was formed when attempts were made to alloy Mo and Sn (*see Hansen's at page 975*). Test results show that an MoSn alloy is not easily formed. Therefore, Takayama '549 does not teach or suggest the formation or dispersion of an intermetallic compound from Mo and Sn.

*Evidence teaches against the formation of a Molybdenum – Tin intermetallic*

With respect to MnSn intermetallic compounds, a recent study includes a Cu-Sn-Mn ternary constitutional diagram and corresponding experimental results (*see Experimental Investigation and Thermodynamic Calculation of the Phase Equilibria in the Cu-Sn and Cu-Sn-Mn Systems*, Metallurgical and Materials Transactions A, Vol. 35A, p. 1641-1654, (2004)). The study is applicable to the present sintered composition, in that it describes the particular formation of crystalline structures in alloyed materials which include each of Cu, Sn, and Mn, as is shown in Takayama '549 cited in the previous Office Actions.

In particular, the Office Action opines that a composition comprising Cu, 5% Sn, and 1% Mn might form an intermetallic consisting of MnSn (*see Table 4, compounds 24 and 25 of Takayama '549*). In fact, Takayama '549, Table 4 discloses a mixture of Cu, with 5 – 10% Sn and 1% Mn. The above cited study shows the equilibrium compositions of Cu-Sn-Mn compositions heated at various temperatures (*see Table IV of the cited study*), listing the equilibrium atomic percent compositions of Mn and Sn.

The Applicant has provided a chart graphically showing the data given in Table IV of the study (*see the chart included, which is labeled “Cu-Sn-Mn system constitutional diagram”*). The data is presented in units of weight percent, derived from the atomic percent values given in Table IV of the study. Note that temperature has little effect on the resulting equilibrium composition characteristics. As shown by the graph, even if the amount of Sn in the composition is 10% by weight, the amounts of Sn and Mn are significantly lower than the equilibrium values shown in Table IV. Accordingly, an MnSn intermetallic compound does not precipitate or disperse in a Cu-10Sn-1Mn alloy to which 1 wt% of Mn is added. Therefore, Takayama ‘549 does not teach or suggest the formation or dispersion of an intermetallic compound from Mn and Sn.

In addition to the evidence provided supporting the patentability of claim 6, *supra*, the present application further supports the superior and unexpected results obtained by the dispersion of intermetallics in the sintered contact material. The dispersed intermetallic compounds improve the sliding properties of the sintered contact material. For instance, the present specification (page 30, lines 16-21) states that the addition of Cr, Mo, and W in a large amount leads to a marked improvement in high-speed sliding properties, which is a result not even suggested in the prior art.

Accordingly, because Takayama ‘549 fails to disclose, teach or suggest each and every limitation of claim 6, a *prima facie* anticipation rejection has not been established, and withdrawal of this rejection is respectfully requested. *See, e.g., Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference”).

Moreover, aside from the novel limitations recited therein, claims 8-10, and 12, being dependent either directly or indirectly upon allowable base claim 6, are also allowable for at least the reasons set forth above. Withdrawal of the rejection of these claims is therefore courteously solicited.

**Claim Rejections – 35 U.S.C. § 103**

In the Office Action, claims 13-19 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over by Takayama '549 et al. (U.S. Patent No. 5,948,549). Additionally, claim 11 was rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Takayama '775 (U.S. Patent No. 6,015,775). These rejections are respectfully traversed.

Aside from the novel limitations recited therein, claims 13-19, being dependent either directly or indirectly upon allowable base claim 6, are also allowable for at least the reasons set forth above. Withdrawal of the rejection of these claims is therefore courteously solicited.

**CONCLUSION**

For at least the foregoing reasons, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the examiner is respectfully requested to pass this application to issue. If the examiner has any comments or suggestions that could place this application in even better form, the examiner is invited to telephone the undersigned attorney at the below-listed number.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. KOM-0153/INO/DIV2 from which the undersigned is authorized to draw.

Dated: July 10, 2006

Respectfully submitted,

By \_\_\_\_\_  
Ronald P. Kananen  
Registration No.: 24,104  
Attorney for Applicant

**RADER, FISHMAN & GRAUER PLLC**  
1233 20<sup>th</sup> Street, N.W. Suite 501  
Washington, D.C. 20036  
Tel: (202) 955-3750  
Fax: (202) 955-3751  
Customer No. 23353

Attachments: references as cited above (also included in accompanying IDS)